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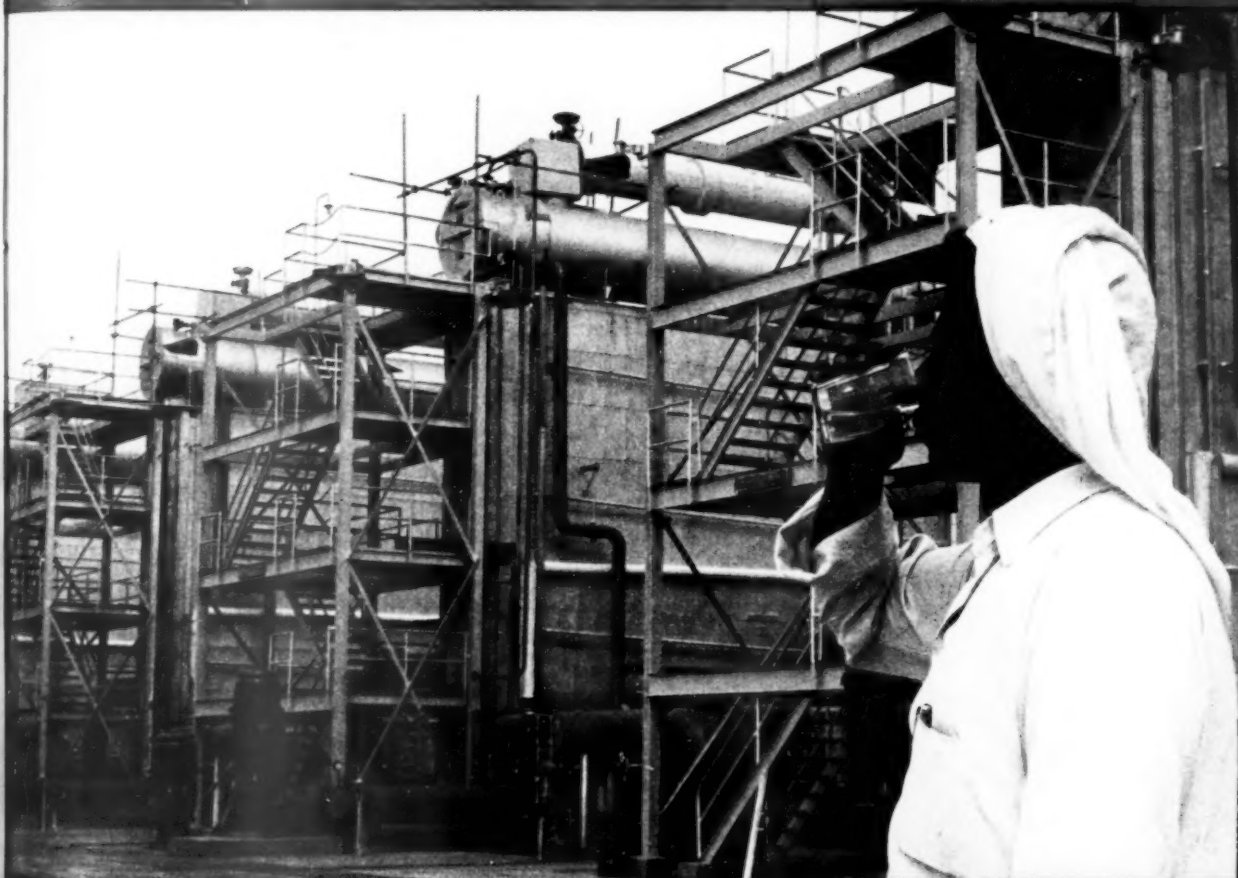
SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Fresh Water in Kuwait

See Page 78

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GENETICS

Radiation Survivors

► A WORLD-WIDE radiation disaster might eventually give rise to two populations, research on bacteria indicates. This is a long shot, however, presupposing that humans react as bacteria do.

Dr. Herbert M. Hirsch, working as a research scholar under the American Cancer Society at the University of Minnesota School of Medicine, Minneapolis, reported experiments that throw light on the alteration and selection of species. Starting with a culture of ordinary (wild-type) bacteria, the scientist added copper ions that produced a "disaster."

Most of the bacteria died, and most of the survivors reproduced very slowly if at all. But as time passed, a small number of survivors, called variants, began reproducing at a rapid rate. They were resistant to effects of poisonous copper and differed in many ways from ordinary bacteria.

Eventually a second population of survivors began to appear, resembling the original bacteria in every respect except that they had just enough resistance to copper to grow slowly in the presence of that poison.

Finally, the completely resistant variants

disappeared as rapidly as they had developed, and the culture was repopulated with ordinary bacteria, with just enough resistance to survive the copper concentrations.

"If humans react as bacteria do," the American Cancer Society said, "it is possible that a world-wide radiation disaster, producing hazards which would endure for generations, would give rise to two populations."

The first population would spring from a few survivors with unusual characteristics and an enormous resistance to radiation. This race would flourish awhile and disappear.

The second would arise from even fewer people, with ordinary characteristics and barely enough resistance to survive, but this race ultimately might prove "durable and dominant."

Dr. Hirsch further reported that cuprous copper, which has only a single charge, is not poisonous to bacteria but that cupric copper, with a double charge, is. Apparently the double charge makes the copper react readily with cell catalysts (enzymes) or other cell components.

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rhagic disease in rats (an infectious effect without tumor). In the course of time the RSV induces tumors and a benign tumor process in rabbits.

Dr. Zilber explains that the hemorrhagic disease in rats and the tumors that appear afterward, as well as the fibrous tumors formed in rabbits by RSV "are new models whose study may prove fruitful" in making clear the nature and mechanism of the neoplastic, or tumor, process.

"For the first time," he states, "it is possible to follow in the same animal the infectious and neoplastic process caused by the same virus."

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MEDICINE

Better Test Found for Early Cancer Detection

► A BETTER TEST for detection of cancer in its very earliest stages, thus increasing the chances of cure, has been discovered.

Three Swiss scientists report on an improved test designed to spot the difference between benign and malignant diseases within the body. The test is based on measurements of an enzyme called gamma-lactic dehydrogenase, which is present in larger amounts when the condition is malignant.

The level of gamma-lactic dehydrogenase also is increased in cases of benign disease, but does not reach the proportions found in malignancy.

Although the number of samples they investigated is too small to justify a definite statement, the scientists point out "the importance of the demonstration of a quantitative and possibly qualitative difference between a normal and a malignant body fluid."

A report on the test by Drs. R. Richterich, K. Zuppinger and R. Rossi of the University of Berne's Medical-Chemical Institute and Children's Clinic appears in *Nature*, 191: 299, 1961.

• Science News Letter, 80:66 July 29, 1961

PSYCHOLOGY

Visual Practice Helps Distinguishing by Touch

► LOOKING AT TWO objects and touching them in the daylight can help you learn to distinguish between them by touch alone in the dark. This is indicated by experiments with monkeys reported by Dr. G. Ettlinger of the Institute of Neurology, London, in *Nature*, 191:308, 1961.

The monkeys learned to obtain a reward of food by grasping and pushing on a strip of foam rubber attached to the top of a food box. Another box had a similar strip attached to the top, but this strip was of wood. Pushing on the wood strip would open that box but was unrewarded because the box contained no food. Both strips, wood and foam rubber, were the same color, black, but differed in texture.

Practice in finding the food in the daylight was some help to the animals in learning to open the boxes in the dark, it was found.

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PUBLIC HEALTH

Treat Czech Alcoholics

► FIFTY PERCENT success has been reported in a treatment center for alcoholics in Czechoslovakia, where the estate of a wealthy brewer was confiscated for use as an anti-alcohol institution.

Studies in Poland and Russia showed treatment of alcoholics in these countries to be inferior to that in Czechoslovakia. Poland has the worst alcoholic problem of the three countries.

Dr. Morris E. Chafetz of Harvard Medical School, associate psychiatrist and director of the alcohol clinic, Massachusetts General Hospital, Boston, reports the studies in *The New England Journal of Medicine*, 265:68, 1961.

Conservative estimates, Dr. Chafetz states, place the number of alcoholic patients in Czechoslovakia (the only Iron Curtain country where he was able to obtain figures) at about 120,000, or roughly two percent of the total population (versus three percent of the total population, or 5,000,000 to 6,000,000 in the United States).

As in the United States, Czechs find the association between alcoholism and broken-marriage rate is very high. A patient recommended for treatment is asked to bring his spouse along for the first visit, and if the interview shows that marital difficulties contribute to the drinking, the marital partner also is taken into treatment.

In Poland, there are insufficient hospital facilities for dealing with alcoholism, which has become an overwhelming problem since the end of World War II. One factor is the

trend to urban living by rural persons who feel lost and lonely without friends and familiar sights.

In Russia, where Dr. Chafetz was welcomed to study alcoholism activities by Prof. D. D. Fedotov, director of the Psychiatric Institute and a member of the Academy of Medical Science, the investigator was told that Russia "has as much alcoholism" as any other country.

"The Soviet attitude toward the alcoholic patient," Dr. Chafetz observed, "tends to be moralistic and punitive, as in the U.S. The Soviets do not achieve the sophistication, interest and extent of Czechoslovakian efforts in alcoholism."

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MEDICINE

Rous Sarcoma Virus Can Affect Mammals

► ROUS SARCOMA virus, which under normal conditions affects only birds, can cause disease in mammals, a Russian scientist reports in the *Journal of the National Cancer Institute*, 26:1295, 1961.

Dr. L. A. Zilber of the Gamaleya Institute of Epidemiology and Microbiology, Moscow, says others had shown the disease-causing effects of Rous sarcoma virus (RSV) on chicks and other birds, but that "our experiments show that the virus can be pathogenic to mammals."

RSV has been shown to produce hemor-

SURGERY

Russian Surgical Stapler

Russian scientists are touring the United States to show the advantages of staplers over conventional methods of suturing wounds, Faye Marley reports.

► RUSSIAN SCIENTISTS are touring the United States to show through operations on dogs how a new Russian-made mechanical stapler can close surgical wounds.

Already Dr. Sarkis Mushegian has performed operations before surgeons in New York, Baltimore, Washington and Philadelphia, and with Nicolai Gorkin, a scientist engineer, and Prof. Mikhail G. Ananyev, director of the Russian Institute of Experimental Medicine in Moscow, will travel from Miami to San Francisco demonstrating the advantages of the staplers over conventional methods of suturing wounds.

Dr. Mark M. Ravitch of Johns Hopkins University introduced the staplers into U. S. surgical practice after a visit to Leningrad in 1958. There he purchased a bronchus stapler for \$440 (equivalent in rubles) and has used it successfully on 100 patients at the Baltimore City Hospital.

"Surgeons should face the fact that we are going to have mechanical devices that will replace traditional handicraft such as hand suturing," Dr. Ravitch told SCIENCE SERVICE. "This does not mean that suturing will be totally replaced, however. Mechanical staplers so far have not been able to get into corners, but they do a more perfect job of vascular suturing than anyone can do by hand."

Dr. Brian Blades, chief of surgery at George Washington University Hospital, agrees with Dr. Ravitch to some extent. He said he would like to buy some of the 20 types of staplers, but he would want to

experiment with them before he put them into clinical use. A metal skin clip has been used for years, but the Russian stapler is an expert instrument, he said.

So far the only importer for the Russian-made staplers is the Cosmos Development Corporation, 45 West 45th St., New York. But a 55% duty will increase the price to something like \$1,350 or more for multi-purpose apparatus.

The V. Mueller Instrument Manufacturing Co., 320 S. Honore St., Chicago, is negotiating with the Cosmos Corporation to be the sole distributors of the staplers in the U.S.

MEDICINE

Air Patient Number 500,000

► THE PATIENT number 500,000 to be landed by domestic aeromedical evacuation, popularly known as Air Evac, was Marine Corp. Michael T. Lingle of Larksville, Pa., flown from Camp Lejeune, N. C., to Andrews Air Force Base, near Washington.

Maj. Gen. O. K. Niess, surgeon general of the U. S. Air Force, met his plane and presented him with a model of the aircraft, a C-131 nicknamed "Samaritan."

Corp. Lingle, who is suffering from ankylosis, a joint ailment, was sent on to the Veterans Administration Hospital at Wilkes-Barre, Pa., near his home.

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William Merz, vice president of the Mueller Company, said that the Russian scientists were planning to demonstrate the stapler at Northwestern University, Evanston, and at a Chicago press conference later.

Among places to be visited by the Russians are the Santa Barbara, Calif., Medical Center, the University of Colorado Medical Center, Denver, the Mayo Clinic, Rochester, Minn., and a number of individual surgeons in various cities.

Boston, Miami, New York, San Francisco, El Paso and Houston, Texas, Tryon and Winston-Salem, N.C., and St. Louis, Mo., are also on the itinerary.

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MEDICINE

Artificial Hip Joints Used After Fractures

► HOPE FOR the elderly who break a hip is offered through use of artificial hip joints.

Of 102 patients, 82% showed excellent or good results when the hip joints were inserted after fractures, Drs. J. George Furey, George E. Spencer Jr. and Donald J. Pierce of Western Reserve School of Medicine, Cleveland, report in the Journal of the American Medical Association, 177:100, 1961.

The average age of the patients was 74, but the surgeons state the operation is not unduly dangerous. They recommend the artificial hip joints also for younger patients with severe mental or physical disabilities.

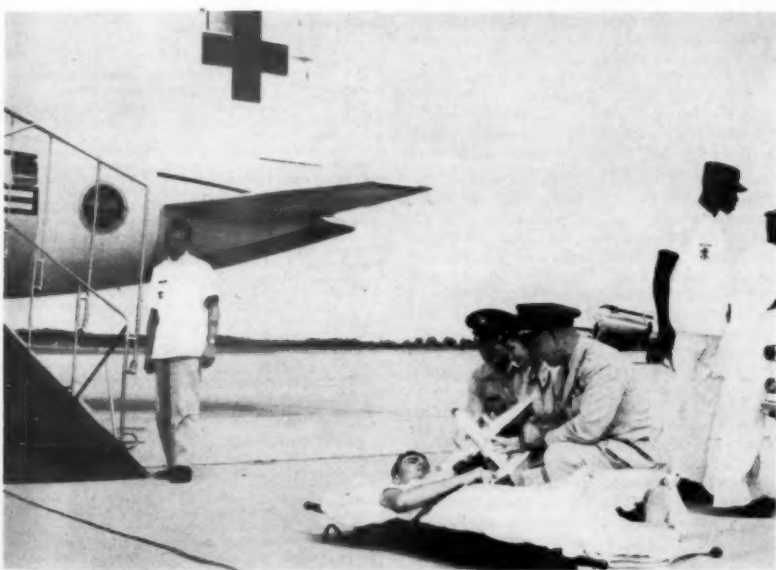
The operation allows weight-bearing on the hip in two to three weeks, whereas other surgical procedures in which the hip is set and allowed to heal require avoiding weight-bearing for six months.

Physicians also read in their official journal that bacteria have been identified as a cause of "athlete's foot" when it affects the toes. The disease, called erythrasma, had previously been classified among those caused by fungus.—Drs. Imrich Sarkany, on leave of absence from the Royal Free Hospital, London; David Taplin and Harvey Blank, all working at the University of Miami School of Medicine (p. 130).

A contraceptive foam that withstands long storage in moist climates without deterioration is reported accepted by 69% of 222 low-income families in a field trial in Puerto Rico. Monthly reports indicate that 22,000 persons in Puerto Rico are using the recently available spermicidal material.—Dr. Manuel E. Paniagua of Rio Piedras, P.R., Dr. Clarence J. Gamble and Henry W. Vaillant of the Population Studies Unit, Harvard School of Public Health (p. 125).

A penicillin-resistant infection resembling gonorrhea was found to be caused by organisms of the tribe Mimosae. Alarming reports from U.S. Navy units in the Mediterranean indicated a penicillin-resistant gonorrhea but laboratory tests discounted the reports. *Neisseria gonorrhoeae* is not resistant to penicillin.—Dr. Richard H. Svihus, Enrique M. Lucero, Ronald J. Mikolajczyk and Edward E. Carter, U.S. Navy Preventive Medicine Unit No. 7, c/o FPO, New York (p. 121).

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AIR PATIENT NUMBER 500,000 ARRIVING.

SCIENTIA INTERNATIONAL

NOVAS DEL MENSE IN INTERLINGUA

Archeologia.—Duo sitos de habitation prehistoric esseva discoperite in le Montanias Zagros de Iran. Iste sitos suggere que le homine in ille region tornava ab un vita de chassa ad un vita agricole inter 15.000 e 8.000 annos retro, i.e. ille cominciava habitar fermas e villages in loco de migrar ab un placia al altere; ille cominciava producer su victualias in loco de colliger los. A Asiab—le un del mentionate sitos—on ha trovate petrificat excrementos que indica que le homines illac mangiava un dietia agricole plus que 10.000 annos retro. A Sarab—le altere del duo sitos—on ha trovate utensiles que apparentemente esseva usate in labores agricole. In le mesme sito on ha etiam trovate evidentia de un domestication de capras.

Meteorologia.—Le statunitense Foundation National pro le Scientia reporta que in 1960 su budget pro recercas concernite con le problemas del modification del tempestate amontava a 1,4 millones dollars, i.e. un quarte million dollars plus que le anno precedente.

Defensa Civil.—Locotenente Colonnello C. L. Hansen del Statunitesse Fortia Aerea ha adressate industria electronic le appello de construir e lanciar al mercato un apparato combine serviente simultaneamente como radio-receptor e detector de radiation ionisante. Un tal apparato, secundo Colonnello Hansen, essera de valor inestimabile inter le mobiles de cameras antiaeree in casas de residentia private.

Medicine Astronautica.—Un experimento que indica un possibile solution del problema del provision de oxygeno a astronautas futur esseva completate al Centro Recercari Chance Vought a Dallas in Texas per Dr. R. O. Bowman e Dr. F. W. Thomas. Un mus esseva claudite hermeticamente in un camera con alimento, aqua, e 4 litros de un cultura del alga *Chlorella pyrenoidosa*. Le mus remaneva in le camera durante un periodo de 66 dies usque ad le exhaustion de su provision de aqua. Durante iste periodo le contento de oxygeno in le atmosfera del camera montava gradualmente ab 21 a 63 per cento. Le mus suffreva nulle mal effectos durante su imprisonment, e illo facilmente se readaptava a un atmosfera normal al conclusion del experimento.

Electronica.—Le creation de materiales semiconductor per le irradiation de chlorinate plasticos con lumine ultraviolette esseva reportate per recercatores del Instituto Polytechnic de Brooklyn. Le specimens irradiate exhibeva etiam le phenomeno de photconductivitate.

Oceanographia.—Un forte corrente submarin esseva discoperite proxime al equator in le Oceano Atlantic per scientistas del Institution Oceanographic Woods Hole. Le corrente, que flue verso le est a profunditates de inter 35 e 75 m, attinge un velocitate de 1 m per secunda e es plus forte que le currents al superficie que curra in le direction opposite.

Pischeria.—Le quasi complete disparition de tructas in le Grande Lacos de America es attribuite al invasion del lacos per lampredas ab le oceano.

Dentisteria.—Un studio conducite per Dr. A. E. Schaefer del Institutos National de Sanitate revela que le incidencia de carie dental in Ethiopia es multo basse, ben que morbos de deficiencia nutritional es frequente in ille pais. Del altere latere, le carie, quando illo es presente, generalmente progredie usque ad le destruction del dente inficite.

Architectura Marin.—Professor T. Inui del

Universitate Tokio ha inventate un proa bulbar que grandemente reduce le formation de ondas e assi contribue al velocitate e efficacia del nave. Le proa esseva testate con successo in le Baia de Osaka.

Astronautica.—Le satellite american "Discoverer XXVI" portava in su capsula, que esseva recuperate le 9 de julio, 1961, specimens de silicium, titanium, yttrium, bismuth, magnesium, nickel, ferro, e plumbo, con le objectivo de determinar le effectos super ille elementos de un ambiente extraterrestre. Il esseva constatate que le structura crystallin de silicium esseva modificate durante le viage per un bombardamento de protones.

Atomica Militar.—Un nove systema pro le detection de subterranean explosiones nucleari esseva proponite al Convention National de Electronica Militar. Le systema se appella AUDIT (post le initiales del phrase anglose, "Automatic Unattended Detection Inspection Transmitter," i.e. automatic transmitter sin personal de inspection pro le detection). Illo consisterea de numerose micre stations de detection que require nulle personal permanente e debe esser visitate infrequentemente pro objectivos de servicio e mantenentia. Iste stations essera transportabile per automobile. Illos functionarea a base de un independente fonte de energia, forsan de energia solar. Un station AUDIT essera un combination de receptor, computer, e transmissor. Tres problemas que debe esser solvite per un tal systema es: (1) On debe esser certe que le station pote recipir le signos de micre explosiones subterranean; (2) illo debe poter distinguer inter un explosion nucleari e seismos o explosiones chimic; e (3) illo debe haber satis potentia pro transmitter signales al plus proxime receptor. On crede que on pote instituer un tal systema a un costo initial de un medie million de dollars per station. Un systema de 3.000 stations costarea un milliardo de medie.

Magazinage de Information.—Le Compania IBM ha perfectionate pro le Agencia Central de Intelligencia del Statos Unite un systema combine de magazinage de information in forma de microfils e de retrovacion instantanee per medio de cartas perforate. Le systema permette le magazinage del equivalente de un bibliotheca de 300.000 volumines in le spatio de un ordinari scriptorio. Le documentos es reduce photographicamente a un millesimo de lor dimensiones original. Le lectura del microfils se face per projection o re-impression magnificata.

Recercas de Cancere.—Drs. C. Martin e S. Magnusson del Collegio Seton Hall in Jersey City reporta que illes ha trovate, con le assistentia de duo studentes, un nove connexion inter commun viruses human e cancro. In experimentos con mus illes usava duo carcinogenos chimic e quatro viruses human. Le mus non reageva al carcinogenos sol e non al viruses sol. Post injectiones del mesme quantitates de carcinogeno e virus in combination, le mus developpava cancro, excepte quando illos habeva essite immunisate contra le virus. Studios additional in que le carcinogenos esseva marcate con radio-isotopos revelava (in vitro) que le viruses se combina con illos, lo que suggere que virus (in vivo) que invade le cellulas pote ager como vector de carcinogenos. Il seque que immunitate contra le virus protege etiam contra le carcinogeno. Iste concepto debe esser studiate in homines. Forsan on potera prevenir certe typos de cancro per vaccinationes contra certe typos de virus.

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GENERAL SCIENCE

Reading Interlingua

► YOU CAN READ Interlingua if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you have never had contact with any foreign language.

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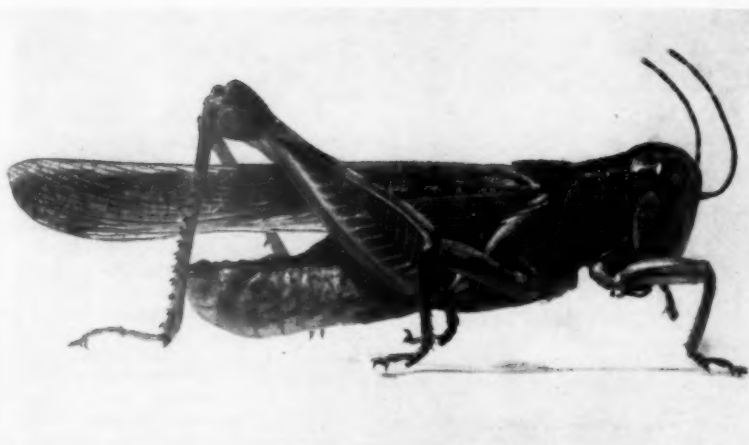
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AT HOME ON THE RANGE—The grasshopper *Melanoplus bilituratus*, one of the range pests, is not the rancher's pet.

AGRICULTURE

Grasshopper Control

► **SPRAY TEAMS** in the states most heavily infested with grasshoppers have been racing against the clock to finish spraying thousands of acres before the grasshoppers lay their eggs.

The grasshoppers mature in July, Leo Iverson of the U. S. Department of Agriculture's plant pest control division in Washington, D. C., said, and they then begin laying eggs. If the spraying is not done before egg laying, next year's grasshopper crop will be well on its way and all the spraying will have to be done again next year.

Spraying of 360,000 acres in Montana and nearly 70,000 in North Dakota, the hardest hit states, was completed in July, Mr. Iverson said. In these areas, grasshopper counts ranged from 30 to 60 insects per square yard; in a few spots, 200 per square yard.

Hot, dry spring and summer weather is the biggest factor in these heavy infestations. The situation in the southwestern states is serious but not of plague proportions. Infestations have been reported from

New Mexico and Texas. New Mexico has 350,000 acres with counts of 12 to 45 hoppers per square yard, and Oklahoma's highest counts are 15 to 25.

No one knows exactly how much damage the grasshoppers have done to the western range, but ranchers consider spraying, at a contract cost of 46 cents to 63 cents per acre, depending on the size of the acreage involved, cheaper than losing grass.

The usual arrangement is for a group of ranchers to have their lands sprayed at one time. The Federal Government pays one-third and the rancher pays the rest unless the state has funds available, in which case it pays one-third.

So far this year, Mr. Iverson said, the Department of Agriculture has contributed \$270,000 toward spraying 400,000 acres. In 1958, the last big grasshopper year, \$1,260,000 in Government funds were spent to spray 5,000,000 acres.

The spray being used is an oil solution of aldrin. Once it has been applied to a field, the grasshoppers are under control.

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PUBLIC HEALTH

Shark Attack Dangers

► **SHARKS GENERALLY** attack humans during daylight hours, but statistics dating back to the year 1580 show that the dangers of swimming in shark-infested waters may be even greater at night.

A 380-year historical record of 790 reported attacks, on file with the Shark Research Panel of the American Institute of Biological Sciences, Washington, D. C., show that 94.3% occurred in daylight, when swimmers and fishermen are most active.

This leaves 5.7% as nighttime attacks. Dr. Leonard P. Schultz, a member of the

panel and curator of fishes for the Smithsonian Institution, believes the percentage of swimmers likely to be in the water in darkness, as compared to daylight, is "significantly smaller" than the percentage attacked by sharks at night.

"If that is true," he reasons, "then it is more dangerous to swim at night."

Reporting in *Science*, 134:87, 1961, Dr. Schultz also notes that in murky waters, as at night, a swimmer may be unable to see and avoid an oncoming shark.

"Many swimmers have pointed out that

they were able to ward off an attacking shark in clear oceanic waters," he said.

The panel keeps a world "Shark Attack File" and attempts to verify and document all reported attacks. Their newly released 1960 census lists 30 unprovoked attacks during the year, compared with 36 in 1959. There were five 1960 fatalities (eight less than in 1959) and 23 injuries, some of them severe. No one was killed in U. S. waters.

There were 12 attacks last year by sharks that had been provoked by being caught, trapped, speared, injured or pursued by humans. None of these was fatal.

A lark with a shark is dangerous, the panel warned. They cautioned swimmers and skin divers against hunting, provoking or hanging onto the tails of sharks, or otherwise "playing" with them.

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PUBLIC HEALTH

Tons of Crops Seized For Too Much Poison

► **THE FOOD** and Drug Administration has to seize tons of crops each year that have too much poison on them to be safe, Representative John E. Fogarty (D-R.I.), chairman of the Appropriations Subcommittee covering health matters, said.

"I never pass a produce market or eat a vegetable salad without wondering if these vegetables are from the few shipments the FDA inspects for safety," Congressman Fogarty told the Association of Food and Drug Officials of the United States in his keynote address in Washington, D. C.

The Congressman said there was a serious question as to whether the \$23,580,000 appropriation recommended for 1962 would be adequate to provide funds for all the responsibilities of the FDA.

New drugs are being placed on the market at a rate of more than one a day, but they must be cleared and labeled for safety before they reach the market.

"The regulatory program facing state and local food and drug officials is tremendous," the Congressman said, adding that they have a big stake in controlling the \$500,000,000 a year business in nutritional quackery, in curbing the cancer racket that takes in more than \$50,000,000 a year, and in wiping out the arthritis and rheumatism quackery that milks the public of \$250,000,000 annually.

He recommended a study of state and local operations by a citizens' advisory committee patterned on the committee that studied FDA in 1955.

"If responsible citizens of your communities will examine their consumer needs in the health, food and drug field," he pointed out, "and then examine the resources of their local government to fill these needs, the result will be not only better understanding of your problems but also better support of your appropriations, laws and activities."

The Congressman said the 1955 citizens' study of FDA needs to be repeated and that he was sure the present Administration would see that a new study was made to cover the changes of the past six years.

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SPACE

Improved Space Capsule

► THE LATEST space capsule has a new life raft aboard that can be tracked by radar.

If the rocket fuel burns longer than planned and the space capsule goes too far and lands where no planes or ships are waiting to make the rescue, the fact that the raft can be tracked by radar makes it easier to locate. The raft is colored international-orange and is aluminized on the inside.

The MR-4 space craft is being used in suborbital flights as well as in the first orbital shot. It is similar to, but has many improvements over, the Freedom 7 capsule that carried Cmdr. Alan B. Shepard, Jr. on the first United States suborbital space flight.

Other improvements on the capsule include a "picture window" 19 inches high that can be used as a navigational aid and for observations of cloud cover and possibly stars.

The instrument panel has also been changed at the suggestion of the astronauts for quicker and easier use. A new clamp ring fairing that holds the capsule onto the Redstone rocket has been installed to cut down on vibrations that interfered somewhat with Cmdr. Shepard's vision on the first flight.

A new type side hatch fastened by explosive bolts replaces a mechanically-operated hatch. This will enable the space pilot to open the hatch by pushing a button or pulling a cable. It can also be removed from the outside. The explosive charge provides rapid escape for the occupant in case of emergency.

The astronaut need not control the Liberty Bell manually on one axis at a time—pitch, yaw and roll—but can merely flip a switch and pull a handle to control all three axes simultaneously.

The new capsule carries two manual control systems, one called the Rate Stabilization and Control System (RSCS), the other, used on Cmdr. Shepard's flight, con-

sisting of a hand controller that directly opens and closes six gas jets, which turn the craft. Using RSCS, hand motions are translated into electrical signals to control the gas jets.

Additional personal equipment for the astronaut includes gloves with nylon-sealed ball bearing rings so he can move his wrist more freely, a new type microphone built into his plastic helmet and more foam plastic in the astronaut's couch to reduce noise and vibration, the National Aeronautics and Space Administration reported in Washington, D. C.

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SPACE

Space Dust Hazards To Be Explored

► THE SATELLITE, S-55, is scheduled to be launched late in August to find out if the tiny specks in space called micrometeors

will erode or in other ways destroy space craft.

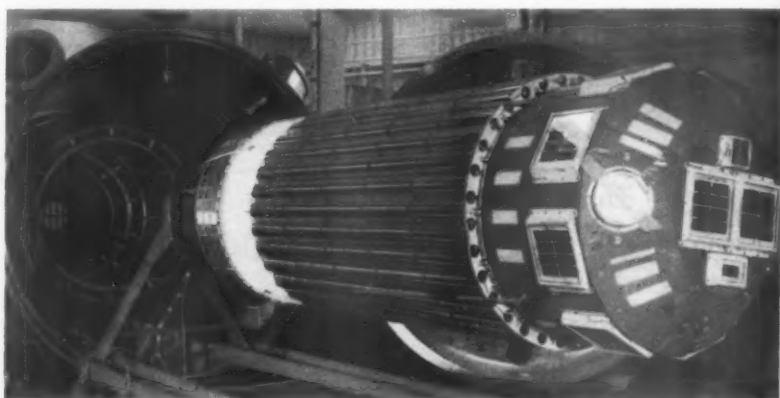
The satellite, which failed to orbit at the first shot on June 29, will send back information from distances between 240 and 620 miles from earth about the make-up of the particles and the hazard they might create for space travelers. It will also record information for the design of solar cells for space craft power by comparing measurements from protected and unprotected cells.

The S-55, to be named Explorer XII if successful, will be launched from Wallops Island, Va., with a four-stage Scout vehicle, the National Aeronautics and Space Administration reported. Another purpose of the mission is to test the performance and stability of the 72-foot, 36,600-pound Scout rocket and its guidance system.

The Air Force has recently reported discovery of a layer of micrometeors at heights up to 102 miles above the earth's surface. The dense dust particles in the band are traveling at speeds up to 47 miles a second.

These micrometeors were trapped by a special rocket nose cone consisting of a pod-like arrangement of leaves opening up like the petals of a flower.

• Science News Letter, 80:70 July 29, 1961



MICROMETEOR SATELLITE—Before insertion in vacuum chamber.

SPACE

Many U.S. Space Programs

► THE UNITED STATES is making inroads on space. It now has 13 projects going, many of which will benefit man on earth. In addition, 10 new projects are coming up.

Man in space is only one of many space programs. Project Mercury of the National Aeronautics and Space Administration was designed to test man's ability to live and perform in space, Project Apollo to carry him to the moon.

Among future NASA space projects are three moon probes: the Ranger, a lunar impact satellite; the Surveyor, a craft for soft-landing instruments on the moon to explore the surface; and the Prospector, which will pick up samples of the moon's surface and send the information back to earth.

Three other future NASA space projects of great importance are OGO, OAO and OSO. The first of these is an orbiting geophysical observatory, the second an orbiting astronomical observatory and the third an orbital solar observatory. They will respectively gather information about the earth, the stars and planets, and the sun.

Space projects already in progress include the experimental Tiros weather satellites to be followed by the operational Nimbus "weather man," both of NASA.

The Air Force Courier and NASA Echo satellites are already testing the possibilities for global communication. NASA Relay and Rebound experimental communications satellites and the Army's Advent are being planned.

The Navy Transit satellites, of which two are now transmitting, will eventually make it possible to navigate by satellite from anywhere on earth. Transit IV-A was the first atom-powered satellite.

NASA's Explorer series has sent back much information about the earth's atmosphere and space itself. The NASA Pioneer satellites have probed deep space measuring cosmic rays and magnetic fields of the earth and the moon. Pioneer V also has the record for long range communication, 22,500,000 miles.

The Air Force Discoverer series is concerned with the recovery of objects returning from space. The Navy Injun satellite, attached at launch to Transit IV-A as was Greb III, is measuring the Van Allen radiation belts. Greb III is studying solar radiation.

The Samos and Midas satellites of the reconnaissance programs are in the hands of the Air Force.

• Science News Letter, 80:70 July 29, 1961

ASTRONOMY

Milky Way Explored

► **NEW PROOF** has been found that the Milky Way Galaxy, to which the sun and earth belong, is a huge spiral with three arms.

Using bright, blinking stars, such as the North Star, Dr. Robert P. Kraft of Mt. Wilson and Palomar Observatories, Pasadena, Calif., is mapping the galaxy as far as 16,000 light years away. A light year is the distance light, traveling 186,000 miles a second, covers in a year, or six million million miles.

Dr. Kraft reported that the sun appears to be in the middle "arm," separated from the outer one by 3,000 light years and from the inner one by roughly half that distance.

The kind of stars used by Dr. Kraft are called "cepheid variables" because they blink rhythmically. Some have longer blink periods than others. Believed to be "young" stars, they pulsate from swelling and contracting, presumably because of internal instability. More than 600 bright cepheids are known in the Milky Way, and they are believed located in the arms.

The blinking stars can tell the distance because their brightness and blink period are related. The longer the period, the brighter the star.

Studies of cepheids in star clusters have shown that those having the same period

are equally bright. If another cepheid has the same period as the North Star (closest cepheid to earth, some 1,700 trillion miles away) but is only one-fourth as bright, the difference in brightness is due to its being farther away. Since brightness varies inversely with the square of the distance, the fainter star must be twice as far away as the North Star.

Astronomers have earlier estimated the shape and size of the Milky Way by studying the spectral characteristics of bright blue stars of the OB type and of red giant stars in the spiral arms.

By looking at the spectrum of a star, astronomers can figure out how bright it is, regardless of how far away it is. After subtracting possible absorption of some of the light by dust in space, the astronomer has enough information to figure the distance to the star.

Another method used by radio astronomers to find the facts about the galaxy is measuring the apparent velocities of hydrogen gas in the spiral arms.

From the velocities in any given direction, the distance can be found. However, the radio astronomer has to rely on the optical astronomer for the "length of the ruler" to use for his measurements.

• Science News Letter, 80:71 July 29, 1961

and operating the necessary world organization.

The Kurtz scheme drew lively interest at the Electronic Industries Association convention in Chicago. It was estimated that War Safety Control, if adopted, would probably double or triple the \$10 billion electronics industry in short order.

• Science News Letter, 80:71 July 29, 1961



BIGGEST RADAR DISH—This is how the 150-foot dish antenna for the Stanford radar telescope will look behind the Stanford University campus when completed later this year. The biggest of its kind in the U. S., it will send and receive signals to study the sun and planets.

RADIO ASTRONOMY

Huge Radar Will Be Used to Probe Planets

► **STUDIES** of the other planets in the sun's system will begin sometime this year with the largest radar telescope in the United States.

Stanford University and Stanford Research Institute, supported by the Air Force's Cambridge Research Laboratories, will cooperate in beaming man-made signals to heavenly bodies and receive the return signals.

In this manner signals were recently bounced off Venus by the Goldstone tracking station, Pasadena, Calif., to give new information about that planet and improve the knowledge of distances in space.

The 150-foot telescope, located behind the Stanford campus, will be second only to the 250-foot steerable dish at Jodrell Bank in England. A million-watt power supply is used by the telescope's transmitter built by Ling-Temco's Continental Electronics Manufacturing Company, Dallas, Texas.

It is the most powerful transmitter ever built to operate in the 20 to 60 megacycle frequency range.

• Science News Letter, 80:71 July 29, 1961

PUBLIC SAFETY

War Safety Control

► **AN ELABORATE** plan for "War Safety Control," based on a gigantic global electronic intelligence system, has been plotted by a New York management consultant who says now is the time "to declare scientific war on war, itself."

The copyrighted report was submitted by Howard G. Kurtz, senior associate with Handy Associates, Inc., to the Foundation for Instrumentation Education and Research, New York.

Mr. Kurtz's formula for a "war-proof world" involves a system of transmission, surveillance and detection equipment, internationally administered. The system would keep an all-seeing electronic eye on military, industrial and economic matters around the globe. War threats, when discovered, would be checked promptly by deterrent forces.

War Safety Control, Mr. Kurtz said, can thus be based on "the most basic world community . . . the universal community of physical fear."

He lays part of the blame for present insecurity and inaction on "an unconscious reluctance to want to bring an end to the threat of war, killing the goose that lays the golden defense budgets."

Mr. Kurtz does not champion disarmament. "A world in which all nations are made safe against each other, and all nations are independent, is not a 'disarmed' world," he said.

But he believes new arsenals of "non-lethal weapons" can be developed to help air and ground forces stop war threats without hurting anyone. Tranquilizing gases and other chemical weapons could be used to subdue armies, or even entire populations, until the situation was under control.

Alarms would be signaled by the complex control system if, for example, a carload of strategic materials was sidetracked from its scheduled factory destination, or a factory began to discharge unusual suspect wastes into a river. Any unusual circumstances implying possible war conditions would be detected immediately.

Mr. Kurtz calls on the United States and its President to take the lead in evolving the "bold new grand strategy," with responsible roles assigned to the State and Defense Departments and the U. S. Information Agency.

"By going forward on this concept we can take giant, forceful world-wide impact strides forward unilaterally without having to wait to negotiate our foreign policy with the Kremlin, as we have done for so long," he asserted.

His report, "The Future Research Challenge: Control of World Crisis," includes a signed statement from 20 prominent figures in science, education and industry who see "no insurmountable barriers" in forming

IMMUNOLOGY

Dr. Salk Defends Killed Virus Vaccine

► **THE KILLED** poliovirus vaccine was vigorously defended by Dr. Jonas E. Salk at a press conference in New York. However, he also gave the Sabin live poliovirus vaccine equal credit for its ability to control poliomyelitis.

The conference, sponsored by the National Foundation, which has supported both Salk and Sabin research, was in rebuttal of the American Medical Association's statement in June that the live poliovirus vaccine developed by Dr. Albert B. Sabin would be more effective in combating polio.

"I do not wish to be a party to any controversy," Dr. Salk said, referring to a comparison of the two vaccines. However, he added, the American Medical Association has overlooked or ignored the demonstrable evidence that the killed virus has been effective.

Dr. Salk said that because of the Salk-vaccinated population in Denmark and Sweden, poliomyelitis had virtually disappeared from those countries, but added that the Sabin live poliovirus vaccine used in Czechoslovakia and Hungary had virtually wiped out the disease in those areas.

When he began his work, Dr. Salk said, he was seeking an answer to the question of whether or not a killed virus could eliminate a disease. Jenner's work with smallpox had shown live virus to be effective, but no one had proved killed virus could be equally effective. Poliomyelitis was the disease he chose to attack. He believes he has proved his point.

• Science News Letter, 80:72 July 29, 1961

MEDICINE

Blood Volume and Flow Measured by Machine

► **AN ACCURATE** instrument for measuring directly the speed and volume of blood flow without opening a blood vessel has been developed.

Drs. Walter Feder and Emmett B. Bay, both of the University of Chicago, department of medicine, told the International Conference on Medical Electronics meeting in New York that they hope to be able to use the device in the operating room within a year. The scientists used eight dogs in a total of 35 measurements.

Their electromagnetic flowmeter has four components. A magnet shaped like an elongated "C" fits around the blood vessel. The vessel is cradled in a bed at the lower point of the "C" and silver-silver chloride electrodes pick up the difference in electrical potential caused by the blood flow. The flowmeter's accuracy was checked by collecting blood from a point in the vessel beyond the point of flow at which the magnet was located.

Among practical uses, the apparatus is expected to be of help to a surgeon in the operating room who needs to have dependable measurements of flow in a wide variety of circumstances.

"The effect of various drugs on blood flow can be accurately assayed," Dr. Feder explained. "The extent to which damaged heart valves affect the forward and backward motion of the blood at every instant can be precisely determined."

Flowmeters were developed in both Germany and the U. S. in 1937, but they were inaccurate. Since 1937 scientists all over the world have developed similar instruments, using both alternating and direct current, but some flowmeters have varied very highly in accuracy.

• Science News Letter, 80:72 July 29, 1961

PUBLIC SAFETY

Calling Aspirin "Candy" Leads to Poisonings

► **TELLING** children that aspirin pills are "candy" very frequently leads to child poisoning.

A study of 94 accidental aspirin poisonings in children shows that in all but one case the children had been told the pills were candy.

The Food and Drug Administration has no plans to label aspirin poison with a skull and bones, so it is up to parents to do their own labeling and take other preventive measures if they are to protect their children from this most common child poisoner.

The toxic effects of aspirin poisoning do not appear until some time after the medicine has been eaten, which is one reason aspirin is a threat to families with young children.

Family ignorance concerning the dangers of aspirin and general lack of safety precautions against household hazards are two main factors in making aspirin a hazard for children. Most families in the study had a special place for medicines but did not appreciate the need for keeping them out of a child's way.

Dr. Roger J. Meyer of Harvard Medical School and Children's Hospital Medical Center, Boston, reports the findings in *American Journal of Diseases of Children*, 102:17, 1961.

• Science News Letter, 80:72 July 29, 1961

PHYSICS

Very High Continuous Magnetic Field Made

► **A CONTINUOUS** magnetic field of 126,000 gauss, believed to be the highest ever produced, has been generated at Massachusetts Institute of Technology, Cambridge, Mass.

The extremely high magnetic field was achieved in a tubular coil magnet about the size of a grapefruit, invented and patented by Dr. Henry H. Kolm of MIT. The Kolm magnet is six times as powerful as a laboratory iron electromagnet producing a field of comparable volume. The earth's magnetic field, which governs the movement of a compass needle, is only one-half gauss.

The magnet was tested at the National Magnet Laboratory in Cambridge under a program initiated by Lincoln Laboratory for the Army, Navy and Air Force.

• Science News Letter, 80:72 July 29, 1961

IN SCIENCE

PUBLIC HEALTH

Overweight Children Become Obese Adults

► **FAT CHILDREN** are likely to become fat adults, a nine-year study of 98 overweight children shows.

In cases where children are grossly overweight, that is, 50% to 60% above normal, hospitalization at the beginning of the weight reduction program is advised. The outlook for boys is a little better than for girls, but all tend to be shorter as well as fatter than normal.

"There was a strong tendency for the obesity to recur after initial weight reduction," three British physicians report in the *British Medical Journal*, July 15, 1961, "and then to persist into young adult life."

The investigators advised energetic treatment of obesity in childhood followed by long supervision to prevent relapse. Among the girls the proportion of grossly overweight patients (above 80% overweight) was greater than at the first examination.

Drs. June K. Lloyd, O.H. Wolff and W. S. Whelen made the study, which is one of very few on the subject, at the University Department of Pediatrics and Child Health and the Children's Hospital, Birmingham, England. Dr. Whelen is now in London, Ontario, Canada.

• Science News Letter, 80:72 July 29, 1961

MEDICINE

Annual Physical Exam Shown Essential

► **AN ANNUAL PHYSICAL** examination is really necessary, a study of 500 supposedly well business executives has shown. Half of the executives, who ranged from 40 to 50 years of age, had significant unsuspected disease.

One of every five of the major, unsuspected diseases was either high blood pressure or heart disease, and another one out of every five was either a peptic ulcer or gallstones, most of which were without symptoms.

Twelve cancers were detected, an incidence of 2.4% or one cancer for every 41 persons.

Dr. John C. Sharpe of the University of California, Los Angeles, Medical School said the study pointed up the necessity of doing complete routine X-ray examinations on apparently well individuals to detect early disease before symptoms develop.

If routine X-rays had not been done, more than two-thirds of the peptic ulcers would have been missed and 80% of the patients with gallstones would not have known of their presence.

Early detection and proper treatment of many diseases will often prevent disability or save a life, Dr. Sharpe said.

• Science News Letter, 80:72 July 29, 1961

VE FIELDS

PSYCHOLOGY

Love Called Essential In Treating the Sick

► LOVE SHOULD HAVE its place among the remedies of the physician along with the antibiotics, tranquilizers, insulin and vaccines.

"The physician's love for his patient and the patient's love for his physician is a powerful influence in the restoration of patients suffering functional disorders (behavioral) as well as for those whose illnesses are predominantly organic in nature," Dr. Leo H. Bartemeier, medical director of the Seton Psychiatric Institute, Baltimore, Md., reports.

The importance of love was taught years ago, Dr. Bartemeier indicates, although it has been largely lost when, with the new emphasis on science, the "objective attitude" become characteristic of psychiatry. How to recapture this humanism is now a problem for both undergraduate and post-graduate medical education.

Dr. Bartemeier quoted Dr. Francis Peabody, who some years ago told his medical students at Harvard University that "One of the essential qualities of the clinician is interest in humanity, for the secret of the care of the patient is in caring for the patient."

He knew, Dr. Bartemeier states in the journal *Mental Hygiene*, 45:323, 1961, that "the love of the physician for his patients was the central and necessary element in relieving them."

• Science News Letter, 80:73 July 29, 1961

AERONAUTICS

Use of Ponds Tested As Runway Safety Factor

► TESTS HAVE BEEN conducted with scale models to investigate use of a shallow pond of water at the end of an airplane runway. Ponds have been proposed as a means of stopping jet transports forced to interrupt a take-off or to overrun designated landing areas.

The National Aeronautics and Space Administration said test results showed "the open water pond could stop the model for most of the test conditions."

Full-scale application of the idea strongly interests civil aircraft operators because no modifications or attachments to the airplane would be required, and the arresting system uses no mechanical devices, the report indicates.

Acting on a request from the Federal Aviation Agency, NASA technicians used Langley Research Center's monorail facility at Langley Field, Va., to launch a dynamic model plane into water as a free body, at simulated speeds up to 100 knots, or about 115 miles per hour. The miniature pond represented a full-scale pond 150 feet wide

and 1,000 feet long, with water depths up to three feet.

At maximum speed and water depth, a full-sized transport would require about 950 feet of stopping distance, tests disclosed. Spray caused the inboard flaps to fail when they were down, and drag force damaged the landing gear. But there were no major indications of steering instability.

Tests also were run with plastic covers placed over the pond. This cut down the required stopping distance and ended the spray problem. But at 100 knots, the main gear and nose gear failed on contact with a thick plastic cover. With a thinner cover, the same two gears always failed at entry speeds of 75 and 100 knots, while a slower 50-knot entry speed caused nose gear failure alone during about half of the runs.

• Science News Letter, 80:73 July 29, 1961

ICHTHYOLOGY

Artificial Reefs Lure Fish Into Barren Coast Areas

► AN ARTIFICIAL REEF, 30 miles long and made of old boats, is being strung along the New Jersey coast from Ocean City to Cape May.

The project, conceived by captains of charter fishing boats, is perhaps the most ambitious one designed to lure fish into the barren stretches of ocean along the coast.

Within the last five years, New Jersey, Delaware, North Carolina, Florida, Texas and California have set up reefs of some kind, Albert Schwartz of the U. S. Fish and Wildlife Service, Washington, D. C., said.

The idea makes use of the fact that fish are naturally curious and tend to congregate around wrecked and sunken ships. The fish apparently are just as curious about old buses, trolleys, auto bodies and big rocks, for they explore these objects as readily as they do a ship.

California has set up test reefs, each of which contains only one kind of discarded vehicle; that is, all buses or all trolleys. The reefs are checked each month for growth of marine organisms, which can serve as food supplies for the fish, and to determine whether the fish prefer one type of junk.

• Science News Letter, 80:73 July 29, 1961

BOTANY

International Plant Index Under Way

► AN INTERNATIONAL plant index being prepared at the Connecticut Agricultural Experiment Station, New Haven, Conn., has progressed to the genus level.

Sydney W. Gould, research associate at the Experiment Station and director of the project, said that his staff has completed punching of 50,000 IBM cards.

They have organized the plant kingdom into its more general taxonomic categories, and are now working on the next lower classification, the genus.

When the work is completed, in about five years, a complete index of the 1,700,000 Latin plant names throughout the world will be bundled together for the first time in a 50-volume master reference.

• Science News Letter, 80:73 July 29, 1961

PUBLIC SAFETY

FAA Head Wants Curb On In-Flight Offenses

► A LAW that would make drunken, disorderly conduct aboard a commercial airliner a Federal offense is being pushed by N. E. Halaby, Federal Aviation Agency Administrator in Washington, D. C.

Mr. Halaby said he was "disturbed" to find that no Federal criminal statutes cover in-flight offenses endangering the lives of passengers, crew members and the general public. He said he and Federal Bureau of Investigation Director J. Edgar Hoover are drafting suitable legislation to present to Congress.

Present laws permit the FAA Administrator to sue for a civil penalty, but leave arrests up to local police after a plane on which a disturbance occurred arrives at its destination.

Mr. Halaby said he has "slapped two civil penalty actions on two drunken fools in flight" on the basis of recent complaints in California. He will ask for "maximum permissible deterrent penalties," which would be fines of \$1,000 each.

One of the two offenders, he said, has been held in a southern California jail "for several days" after creating "havoc in the cockpit" during a Chicago-to-Los Angeles flight. In both cases, he said, the men involved were drunk before they boarded their respective planes. No names were released.

Mr. Halaby also believes air carriers should be "stricter and more careful about letting people on planes who are under the influence of alcohol."

As for drinking during the flight itself, Mr. Halaby commented: "There are quite a few people who can go without a drink for the duration of any domestic flight. I commend them to you."

• Science News Letter, 80:73 July 29, 1961

CHEMISTRY

New Process for Synthetic Rubber

► ISOPRENE for the production of synthetic natural rubber can be produced by a new process at a cost competitive with other beginning materials in the rubber industry.

The new process combines two molecules of propylene, a by-product of petroleum cracking, to form a six-carbon atom molecule called methylpentene. A carbon atom is then knocked off this molecule to give the five-carbon atom molecule isoprene. This compound can be polymerized to form a rubber that is essentially identical to natural rubber.

The process was developed by the Goodyear Company and the Scientific Design Company, V. J. Anhorn and K. J. Frech, Goodyear Company, Gerson S. Schaffel and David Brown of the Scientific Design Company reported.

A new Goodyear plant in Beaumont, Texas, will use the Goodyear-SD process.

• Science News Letter, 80:73 July 29, 1961

VITAL STATISTICS

New People—Same Old Trends

Increase in population and migration westward are old trends still prevalent. The U. S. can feed twice its present population at the same living standards, Tove Neville reports.

► THE UNITED STATES can feed more than twice its present population at the same high standard of living.

This is the estimate of the director of the U. S. Census Bureau, Richard M. Scammon, who told *SCIENCE SERVICE* he believes the U. S. could, if necessary, feed a population of 400,000,000.

The 1960 census showed the total population for the 50 states to be 179,323,000, which is 28,000,000 more persons than in 1950. The total, including all outlying areas and U. S. citizens overseas, came to 183,285,009, or 29,000,000 more than in 1950.

The 1950 census already showed a trend toward population increase.

Bureau director Scammon said he believes this country can provide for its citizens if it has a will to do it and plans nationally.

This will be necessary in the U. S. in another 40 to 50 years, when the population will double itself if it continues to grow at the present rate.

In the past 60 years the country's population has more than doubled, and every ten and a half seconds of every day a "census clock" in the Commerce Department in Washington adds one more to the total. The 185,000,000 mark is expected to come in November, 1961, and citizen number 200,000,000 should arrive in 1966.

Population Growth Uneven

The population growth during the last ten years was not evenly distributed over the country. Generally the West and Southwest, and metropolitan areas (50,000 inhabitants or over), had the greatest increase in population, much of it from migration.

The historic movement westward continued. During the 1950's it gave California alone 5,000,000 new inhabitants. Rates of growth were also very high in Arizona, Nevada, Florida and Alaska. The migration to metropolitan areas, where now more than two-thirds of the country's population lives, was mostly from farms and small towns.

The decline in the farm population is believed to have created better opportunities for those who remained, but it has also meant many problems for local business and government facilities and for those engaged in educational, religious and social services.

Census results show a migration also took place to states having beaches, those bordering the Pacific and Atlantic Oceans, the Gulf of Mexico and the Great Lakes.

In 1890, two-thirds of all persons in the U. S. lived on farms and one-third in cities. By 1950, this was reversed. Now the percentage in rural areas has declined to about 30%. In 39 states the urban population

amounts to more than half of the total. Only 11 states had a majority on the farms.

New Jersey leads all the states with the largest proportion of city-dwellers, who make up 88.6% of the population. States having more than 75% of their population in cities are: California, Rhode Island, New York, Massachusetts, Illinois, Connecticut, Hawaii and Texas.

The 11 states that have a larger rural than city population are Alaska, Arkansas, Idaho, Kentucky, Mississippi, North Carolina, North Dakota, South Carolina, South Dakota, Vermont and West Virginia.

Many of the largest cities showed a decrease in inhabitants in downtown areas, among them New York, Chicago, Philadelphia and Detroit.

Director Scammon said it was mainly the white population that moved away from the centers of big cities to the suburbs.



COMPUTING THE CENSUS—
Above is the first punch card machine, used in the 1890 census. Below, an employee at the U.S. Census Bureau feeds data into a modern electronic computer, UNIVAC 1105.

Mostly Negroes from farms and the South moved to the centers of cities.

In 1790 the Negro population in the U. S. was 20% of the total. By 1860 it had dropped to 14%, and the decline continued into the 20th century, especially in periods of large immigration. In the last ten years, the Negro population has increased slightly more rapidly than the total population, now making up 10.5%.

During the last ten years the movement of Negroes from the South to the North and West has also increased. In the past decade more than 1,500,000 Negroes have moved from 13 southern states. From Mississippi alone 300,000 migrated. The states of Alabama, Arkansas, Georgia, North Carolina, South Carolina and Virginia lost more than 100,000 each.

Most of these Negro migrants were young adults.

Additional Findings

Other findings of the 1960 census include: National population density average is now 50.5 persons per square mile as compared to 50.7 in 1950. Had Alaska and Hawaii been states in 1950, the population density then would have been 42.6 persons to the square mile.

In the last decade 49 counties have doubled their population while 1,537 lost inhabitants.

Age-wise, Americans dropped from 30.2 years as the average age to 29.5, the first age-drop since the original census was taken in 1790. Median age in 1800 was 16 years and 22.9 years in 1900.

The average size of families is 3.65 persons. In the northern and Pacific Coast states, the average size of families is below the national average; in the South and mountain states the average family is above the national.

Hawaii has the largest average family and Florida has the smallest. Hawaii also has the largest population of Asiatic origin, more than half of all Hawaiians.

Almost 41,000,000 babies were born in the last ten years and 15,610,000 deaths were counted. The South produced most babies and it also had the largest out-migration.

The greatest population increase took place among the youngest and the oldest citizens. The number of children under 15 increased nearly 40%, to a high degree because of the higher birth rates after World War II. Persons 65 or over increased in number by about a third.

At the same time there was a decrease among the 18- to 34-year-olds. This uneven growth is caused by the uneven annual number of births in the past. The total elementary and high school age group amounted to about 44,000,000.

Housing has improved during the decade. Out of 47,000,000 dwellings, 80% were in sound condition.

Home ownership has increased even more

than the population has. In 1960, 61.9% of all housing units were lived in by the owners. In 1950 only 55% of all housing facilities were home-owned.

The five cities having the largest land area are: Los Angeles, 454.8 square miles; Houston, 328.9; Oklahoma City, 321.5; New York City, 315.1; Hilo, Hawaii, 292.4. Of these, New York has 24,697 persons to the square mile whereas Hilo has only 89.

The five most populated cities are: New

York with 7,781,984; Chicago, 3,550,404; Los Angeles, 2,479,015; Philadelphia, 2,002,512; and Detroit, 1,670,144.

Girls and women outnumber boys and men, except in the Mountain and Pacific states and the Dakotas. In Alaska, women are outnumbered: there are 132.3 men for each 100 women. At the other extreme, Massachusetts has only 93.4 men for each 100 women.

• Science News Letter, 80:74 July 29, 1961

INVENTIONS

Patents of the Week

A rocket launching and fire control system to make interceptor attack aircraft more maneuverable, versatile has been patented. A new radiation shielding material was made.

► AN IMPROVED rocket launching and fire control system, aimed at boosting the maneuverability and tactical versatility of rocket-armed interceptor attack aircraft, has been patented by four Californians.

Rights to patent No. 2,992,423 were assigned to Hughes Aircraft Company, Culver City, Calif., by inventors George F. Floyd of Rolling Hills, Jack Howard Irving of Santa Monica, Harold R. Kaiser, Woodland Hills, and Ruben F. Mettler, Los Angeles.

The system features a computer-run fire control mechanism capable of directing attacks against bombers or other aircraft "from any direction, and from above or below the target." Split-second accuracy would enable interceptor planes to fire rockets at target craft broadside, rather than being limited to the conventional tail-zone attack course. The target would be bigger and the danger from return fire less.

Computers in the attacker craft would produce signals from tracking radar to guide the craft by the shortest possible route to a correct launching position and fire the rockets. Pilot errors and maneuvering effects would be automatically corrected by continuous recomputation.

Adding a barium sulfate aggregate to the cement, sand and water normally used in concrete mixes gives a shielding material effective against neutron radiation, according to inventor Dr. Lyle B. Borst of New York University. He won patent No. 2,992,175 for the material, described as capable of "slowing down fast neutrons as well as shielding against gamma radiations." Rights were assigned to the Atomic Energy Commission.

The use of a drug compound that reportedly controls epileptic seizures is the subject of patent No. 2,992,163, obtained by Nelson R. Easton, Indianapolis, Ind. The patent covers both the treatment process and "a solid pharmaceutical dosage form for oral administration." Rights were assigned to Eli Lilly and Company, Indianapolis drug manufacturers.

The compound bears the technical name 4-chloro-1,2-pyrazole. Its anticonvulsant action has been successfully tested with adult epileptic patients given daily doses varying

from 50 milligrams to two grams, the inventor reported.

A mechanical chicken plucker capable of defeathering the birds in batches of 12 or more was given patent No. 2,991,497. Inventors Robert W. McKinley and Joseph Howard Ernstes, Greensburg, Ind., assigned rights to the Ashley Machine Company, a Greensburg firm. The concept is not new, but a previously patented feather picking machine handled only one bird at a time, with the operator required to hold the bird. The McKinley-Ernstes device provides for an automatic operation with the birds "confined loosely in batch formation."

Freshly scalded poultry is dropped into a stationary chamber containing a rotating drum, its surface sloped so that small birds fall to the bottom and larger birds stay near the top. Both the inner surface of the chamber and the outer surface of the drum are covered with flexible rubber "fingers." When the drum starts spinning, its fingers remove the feathers through rubbing or stripping action. At the same time, the fixed fingers on the chamber wall slow the speed of the birds but keep the entire batch in a state of agitation.

The machine is adaptable to ducks, turkeys and other fowl, its inventors claim.

• Science News Letter, 80:75 July 29, 1961

SPACE

Pilots Learn to "Fly" Rings Around Moon

► PILOTS HAVE LEARNED to "fly" rings around the moon.

This was done while "flying" a space craft simulator in an attempt to find out if a pilot could change his flight path as he approached the moon from earth.

The paths of the simulated space ship "shot toward the moon" were set to miss the moon surface by 40 to 80 miles at speeds of from 8,200 to 8,700 feet per second at closest approach.

The pilot was given control of the thrust and torques about all three axes of the craft. The pilot saw a graph of the vehicle rate of descent and circumferential velocity, an altimeter, and vehicle attitude and rate meters.

The pilots soon became adept at "flying around the moon" and learned to establish orbits within a range of 10 to 90 miles above the lunar surface. M. J. Queijo and Donald R. Riley of Langley Research Center, Langley Field, Va., reported to the National Aeronautics and Space Administration.

• Science News Letter, 80:75 July 29, 1961

TECHNOLOGY

"Flash Evaporator" Produces Fresh Water

See Front Cover

► A NATIVE in Kuwait drinks fresh water produced from sea water by a "flash evaporator" seen in the background of the cover of this week's SCIENCE NEWS LETTER.

A new distillation plant ordered from Westinghouse Electric Corporation, Pittsburgh, Pa., for the Arabian Oil Company will produce 500,000 gallons daily and bring the capacity of the desalting units in the Kuwait area to 5,230,000 gallons a day—the largest concentration of sea water units in the world.

• Science News Letter, 80:75 July 29, 1961

PUBLIC SAFETY

Urges Making Autos Safe for Accidents

► ENGINEERS should try to design an automobile "safe to have accidents in" under normal conditions of daily use, an accident causation expert with the New York State Department of Health said.

If automobile occupants "were properly packaged, instead of riding like a teacup in an empty barrel," deaths and injuries would be substantially reduced, Dr. William Haddon Jr. of Albany, N. Y., said.

He pointed out that design modifications could eliminate such injury-causing protrusions inside automobiles as knobs, screws and sharply hooded projections above instrument panels. He also quoted a medical textbook citing the fronts of some modern autos as close approaches to an ideal design for "a pedestrian-injuring mechanism."

Dr. Haddon said four percent of all vehicles manufactured strike and injure pedestrians during their period of use, and between one-fourth and two-thirds of all vehicles are involved in accidents in which their occupants are injured or killed.

Safety measures have to be devised that depend on "passive acceptance" by the public, rather than "any degree of continued, active cooperation," he believes. The advance engineering approach is more effective than safety education, just as putting fluoride into public water supplies to prevent tooth decay is more effective than trying to get parents to give their children fluoride pills daily.

"The claims made for highway safety activities are being found to be very largely based on inadequately documented opinion and not on even reasonably scientific evidence," he told the Society of Automotive Engineers in New York.

• Science News Letter, 80:75 July 29, 1961

Books of the Week

For the editorial information of our readers, books received for review are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C.

ADVANCES IN ELECTRONICS AND ELECTRON PHYSICS, Vol. XIV—L. and Claire Marton, Eds.—*Academic Press*, 341 p., illus., \$14.20. Treats problems of photo-conductivity, hydrogen thyristors, Cerenkov radiation, and high-power axial-beam tubes.

ALIVE IN SPACE: The Science of Bio-astronautics—Robert Wells—*Little*, 180 p., illus. by Robert Curran, \$3.75. Discusses for young people space instruments, weightlessness, living in space and training for space.

ATLAS OF HUMAN ANATOMY—Franz Frohse, Max Brodel and Leon Schlossberg—*Barnes & Noble*, rev. 6th ed., 180 p., illus., paper, \$2.95. Describes the human body through charts, standard guidebook for nurses, doctors, students and general reader.

ATOMS AND MEN—Louis Leprince-Ringuet, transl. from French by Elaine P. Halperin—*Univ. of Chicago Press*, 118 p., \$3. French atomic energy commissioner writes about science, its process, and the intellectual material conditions it needs to thrive.

AUTHIGENIC MINERALS IN SEDIMENTARY ROCKS—G. I. Teodorovich, transl. from Russian—*Consultants Bur.*, 120 p., illus., \$22.50. Treats in detail characteristics, conditions of formation and classification of authigenic, principally syngenetic, minerals.

BEHAVIOR MECHANISMS IN MONKEYS—Heinrich Kluever, introd. by K. S. Lashley—*Univ. of Chicago Press*, 387 p., illus., paper, \$1.95. First published in 1933, is a classic on the neurophysiology of behavior.

BIBLIOGRAPHY OF FOSSIL VERTEBRATES, 1949-1953—C. L. Camp and H. J. Allison—*Geological Soc. of Am.*, 532 p., \$8.25. Complete index of publications in vertebrate paleontology and paleoanthropology, author catalogue, subject index and systematic index.

CELL HEREDITY—Ruth Sager and Francis J. Ryan—*Wiley*, 411 p., illus., \$7.50. Discusses

genetics at the cellular level, for college students, general reader and scholars in disciplines other than genetics.

CHANGING VIEWS OF THE UNIVERSE—Colin A. Ronan—*Macmillan*, 206 p., illus., \$3.95. Historical sketch of the attitudes with which men have looked at the cosmos, from early civilizations to the 20th century.

CHEMISTRY FOR CHILDREN—Virginia L. Mullin—*Sterling*, 117 p., illus. by Bernard Case, \$2.95. Introduces boys and girls to the language of chemistry and laboratory techniques, and gives instructions for many experiments.

THE CHOSEN FEW: An Examination of Some Aspects of University Selection in Britain—W. D. Furneaux—*Oxford Univ. Press*, 245 p., \$4. Results of a ten-year study analyzing university student selection techniques and their functioning.

A CONCISE DICTIONARY OF ABBREVIATIONS—George Mayberry—*Tudor*, 159 p., \$3.75. List of key abbreviations in general use and in special fields.

DARWINISM AND THE STUDY OF SOCIETY: A Centenary Symposium—Michael Banton, Ed.; introd. by J. Bronowski—*Quadrangle Bks.*, 191 p., \$5. Essays based on papers read at conference held at the University of Edinburgh, 1959.

THE DEATH OF ADAM: Evolution and Its Impact on Western Thought—John C. Greene—*New Am. Lib.*, 382 p., illus., paper, 75¢. Traces the rise of the idea of evolution and the decline of the idea of creation in the century and a half from Newton to Darwin. First published in 1959.

THE DREAMS OF REASON: Science and Utopias—Rene Dubos—*Columbia Univ. Press*, 167 p., illus., \$5. Examines the influence of Bacon on the modern structure and development of science, the limits to which scientific inquiry is subject and the dilemmas of medical research.

ELEMENTARY PARTICLES—Enrico Fermi—*Yale Univ. Press*, 110 p., paper, \$1.25. Reprint, attempts to present some of the significant results of the field theories of elementary particles that can be understood without excessive mathematics.

FISHES AND HOW THEY LIVE—George S. Fichter—*Golden Press*, 54 p., illus. by Rene Martin and James Gordon Irving, 69¢. For young readers.

FLOW OF FLUIDS THROUGH POROUS MEDIA—Royal Eugene Collins—*Reinhold*, 270 p., illus., \$12.50. Unified treatment of all aspects of all types of flow, primarily directed to petroleum engineers and to research workers.

FLUOROSIS: The Health Aspects of Fluorine Compounds—Edward J. Largent—*Ohio State Univ. Press*, 140 p., illus., \$3.50. Comprehensive, up-to-date review of research on all aspects of fluoride metabolism and its toxicology with particular reference to occupational exposure to fluorides.

FROM GALILEO TO THE NUCLEAR AGE: An

Introduction to Physics—Harvey Brace Lemon—*Univ. of Chicago Press*, 468 p., illus., paper, \$2.95. Reprint of second edition, interpreting physics non-technically, including nuclear structure, radioactivity and isotopes.

FUEL ELEMENT FABRICATION: With Special Emphasis on Cladding Materials, Vol. 2—International Atomic Energy Agency—*Academic Press*, 384 p., illus., \$10. Proceedings of a Symposium held in Vienna, May 10-13, 1960.

GUIDES TO NEWER EDUCATIONAL MEDIA: Films, Filmstrips, Phonorecords, Radio, Slides and Television—Margaret I. Rufsvold and Carolyn Guss—*Am. Lib. Assn.*, 74 p., paper, \$1.50. Guide to catalogues and lists, services of professional organizations and journals, providing information on educational audio-visual materials.

A HANDBOOK OF BIOLOGICAL ILLUSTRATION—Frances W. Zweifel—*Univ. of Chicago Press*, 131 p., illus., paper, \$1.95. To help the biologist who is not an artist and the artist who is not a biologist. Treats materials, drawing techniques, measurements, graphs and printing processes.

HIGHLIGHTS OF RESEARCH PROGRESS: Allergy and Infectious Diseases, 1960—National Institute of Allergy and Infectious Diseases—*GPO*, 71 p., paper, 30¢. Covers virus diseases, allergy, immunology, parasitic, bacterial, fungus and rickettsial diseases.

HOW TO FIX TRANSISTOR RADIOS & PRINTED CIRCUITS, Vols. 1 and 2—Leonard Lane—*Gernsback*, rev. ed., 160 p., 160 p., illus., \$9.90 per set; paper \$3.20 each, \$5.90 per set. Non-mathematical course of semiconductor fundamentals and their practical application.

HYPNOSIS IN OBSTETRICS: Obstetric Hypnoanesthesia—Ralph V. August, M.D.—*McGraw*, 160 p., 33 1/3 rpm long-playing record, \$10. Presents obstetrician's practical experiences with the use of hypnosis in obstetric care, for physician-readers.

INVESTING IN SCIENTIFIC PROGRESS, 1961-1970: Concepts, Goals and Projections—Richard H. Bolt, Ed.—*National Science Foundation*, 30 p., paper, free upon request direct to publisher, Washington 25, D. C. Describes the desirable growth of basic research and its needs during the next decade.

JOSIAH MACY, JR. FOUNDATION: A Review of Activities, 1956-1960—Willard C. Rappleye, M.D., Pres.—*Macy*, 66 p., paper, single copies free upon request direct to Foundation, 16 W. 46th St., New York 36, N. Y. Five-year review and projections of research activities.

LIFE OF THE PAST: An Introduction to Paleontology—George Gaylord Simpson—*Yale Univ. Press*, 198 p., illus., paper, \$1.45. Reprint, discusses in nontechnical terms the scope and significance of paleontology as a science concerned not only with the identification of fossils, but with the principles and interpretation of the history of life.

LIGHT WAVES AND THEIR USES—A. A. Michelson—*Univ. of Chicago Press*, 166 p., illus., paper, \$1.50. Reprint of work by first American Nobelist.

MAMMALS OF THE SOUTHWEST MOUNTAINS AND MESAS—George Olin—*Southwestern Monuments*, 126 p., illus. by Edward Bierly, \$3.25; paper, \$2. Maps, habitats and descriptions on each species of the southwest uplands.

MATHEMATICAL MACHINES, Vol. I: Digital Computers. Vol. II: Analog Computers—Francis J. Murray—*Columbia Univ. Press*, 300 p., 385 p., illus., \$12.50, \$17.50. Discusses basic principles, stressing fundamental ideas rather than engineering detail.

THE MERCK MANUAL OF DIAGNOSIS AND THERAPY—Charles E. Lyght, M.D., Ed.—*Merck Sharp & Dohme Research Labs.*, 10th ed., 1907 p.

(Continued on p. 79)

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by A. H. Russell

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MEDICINE

Lung Disease Fungus

► **STARLINGS** in two parks of Washington, D. C. have been blamed in contaminating soil that has produced the fungus causing histoplasmosis, a frequently serious lung disease.

The fungus, *Histoplasma capsulatum*, had previously been found in the soil of two parks in smaller cities, Milan, Mich., and Mexico, Mo., but this is the first time it has been found in Washington, or in any other large city. It has been found many times in nearby Maryland and Virginia.

Dr. Chester W. Emmons, chief of the medical mycology section of the National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Md., reports the findings in Public Health Reports, 76:591, 1961, a U. S. Public Health Service publication.

Dr. Emmons was searching for the cause of another serious fungal disease, cryptococcosis, which has been isolated many times from Washington soil contaminated by pigeon droppings.

Histoplasmosis is caused by humans in-

haling contaminated soil or dust. It varies from a harmless condition to an incapacitating lung lesion, or it may take a fatal form characterized by chronic lesions of various internal organs.

Dr. Emmons said that although the park area from which the contaminated soil was taken had been recently cleaned and showed no obvious bird excreta, the soil under sycamore trees where the collections were made is regularly contaminated with the bird droppings.

"It is obvious," he said, "that roosting starlings can create a soil environment suitable for the growth of *Histoplasma capsulatum* even though bird excreta do not accumulate and remain on the surface of the soil."

Dr. Emmons said that histoplasmosis is an important medical problem in Washington and surrounding areas. In certain Maryland and Virginia communities, he said up to 83% of the population showed evidence of past exposure to the disease.

• Science News Letter, 80:78 July 29, 1961

MEDICINE

May Reduce Stillbirths

► **USE OF A RADAR** technique holds promise of reducing the number of stillbirths and newborn deaths through better fetal electrocardiograms.

Andrew G. Favret, Department of the Army, Washington, D. C., reported that more widespread use of the fetal electrocardiogram appears possible using a technique highly developed in the radar field.

Very weak "echoes" could now be detected that otherwise have been buried in "noise," Mr. Favret told the Rochester (N. Y.) Conference on Data Acquisition and Processing in Biology and Medicine.

Fetal electrocardiograms have been made for years under controlled conditions, but the combination of an inherently weak fetal signal and variety of competing electrical signals (noise) has prevented "the widespread use of this important tool by hospitals and obstetricians," Mr. Favret said.

Valuable information can now be provided on the condition of the fetus in early stages of pregnancy as well as during labor through use of the fetal ECG.

► **TWO NEW CONCEPTS** in mathematical models of the neuron were reported by Dr. Eugene Agalides of General Dynamics, Rochester, N. Y., to the Conference on Data Acquisition in Rochester.

Chemical transmission in which one chemotransmitter acts upon two chemoreceptors, he said, means that the chemotransmitter could eventually make permanent changes in the linkages of the proteins of ribonucleic acid.

"This brings us to a new kind of adaptive memory," he explained in describing his second new concept. "This is not made by

one neuron, or prosynapse, but makes possible different interconnections. It increases the number of phosphorylated pathways and makes possible a new combination of ideas."

• Science News Letter, 80:78 July 29, 1961

IMMUNOLOGY

Health Service Sees Measles Vaccine Soon

► **FEAR OF THE DEAFNESS** and brain damage sometimes following measles will soon be a thing of the past when vaccines reach the standards set by the U.S. Public Health Service.

In a few years, at least, measles vaccination will be as common as polio inoculations. Measles takes several hundred lives in the U.S. each year. Although death from the disease is rare, close to 100% of American children can be expected to get measles.

Complications are common because of secondary bacterial infections, unfavorable effects on pre-existing illness, or even due to the virus itself.

Because measles is a world-wide problem, an international conference on measles immunization will be held this fall at the National Institutes of Health in Bethesda, Md., Surgeon General Luther L. Terry of the Public Health Service has announced.

At a three-day meeting Nov. 7 to 9, a number of experiments with the attenuated (weakened) measles virus strains developed by Dr. John F. Enders, Nobel Prize winner, Harvard University, will be discussed at sessions covering data on field trials, problems of production and biologic control and aspects of the disease in other countries.

The conference is under the joint sponsorship of the University of Colorado, the National Institute of Allergy and Infectious Diseases, and the NIH Division of Biologics Standards.

Dr. C. Henry Kempe, University of Colorado Medical Center, who has been working over a period of years on measles immunization and other problems of infectious diseases of children, will direct plans for the conference.

• Science News Letter, 80:78 July 29, 1961

MEDICINE

Heart Damage Findings Disprove Previous Theory

► **HEART DISEASE** does not develop in rheumatic fever patients unless the first attack of rheumatic fever damages the heart, Dr. Alvan R. Feinstein, an Irvington-on-Hudson, N.Y., physician, has found.

The discovery explodes a long held theory that one-fourth of the patients whose hearts show no damage after the initial attack may develop heart disease later.

Dr. Feinstein disclosed his findings, for the first time, at the American Rheumatism Association meeting in New York. The doctor and five co-workers at Irvington House, where he is director, studied the hearts of 447 rheumatic fever patients, children and adolescents, for an average of seven years.

All the patients were being given some kind of prophylactic agent to reduce the rate of recurrent rheumatic fever attacks. Despite treatment, 48 recurrences occurred in 39 patients, or about nine percent of the total.

In the recurrent attacks, carditis (inflammation of the heart) did not appear in patients previously free of it. In patients who already had carditis from the first acute attack, the recurrences often, but not always, made the heart worse.

Among 180 patients free of heart damage in the first attack of rheumatic fever, no heart damage developed, with or without a recurrence of rheumatic fever.

Dr. Feinstein said the study should lead to new concepts of treatment for rheumatic fever. Patients with no initial heart damage need not be subjected to extended bed rest with all the discomfort and restlessness this involves for children.

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Questions

SURGERY—In what type surgery are clamps said to be especially superior? p. 67.

AGRICULTURE—Why must grasshoppers be sprayed quickly after they mature? p. 69.

Photographs: Cover, Westinghouse Electric Corporation; p. 67, Military Air Transport Service Organization; p. 69, U. S. Dept. of Agriculture; p. 70, National Aeronautics and Space Administration; p. 71, Ling-Temco—Stanford; p. 74, U. S. Census Bureau; p. 80, Keuffel and Esser Co.

Books of the Week

(Continued from p. 76)

illus., \$7.50. Updated and thumb-indexed handbook for physicians and their associates.

MODERN ELEMENTARY SCHOOL SCIENCE: A Recommended Sequence—Willard J. Jacobson and Harold E. Tannenbaum—*Teachers College*, 194 p., paper, \$2.25. Discusses effective elementary school science program and includes recommendations for junior high school science, and for biology, chemistry and physics in the senior high school.

NATURAL POLYMER MAN-MADE FIBRES—C. Z. Carroll-Porczyński—*Academic Press*, 303 p., illus., \$11.20. Presents results of recent scientific investigations for readers engaged in manufacture or in research and development work of organic man-made fibres.

THE NEW INTERNATIONAL YEAR BOOK: A Compendium of the World's Progress for the Year 1960—Drenka Willen, Ed.—*Funk*, 557 p., illus., \$11. Survey volume of scientific, social and political events in 1960. Section on physics contributed by Science Service.

NEW LIVES FOR OLD: Cultural Transformation—Manus, 1928-1953—Margaret Mead—*New Am. Lib.*, 460 p., photographs, paper, 75¢. Anthropologist shows what happens when a Stone Age culture comes in contact with and tries to adopt 20th century way of life. Reprint.

THE NEW SCIENCE OF GIAMBATTISTA VICO—Transl. from 3rd ed. (1744) by Thomas Goddard Bergin and Max Harold Fisch—*Double-day*, rev. ed., 384 p., paper, \$1.45. Abridged revision of 18th century Italian work on social theory.

NEW THINKING IN SCHOOL MATHEMATICS—Howard F. Fehr, Ed.—*OEEC Mission*, 246 p., paper, \$2.50. Report of the deliberations and conclusions of a seminar initiated by Organization for European Economic Co-operation for the purpose of improving mathematical education.

NUMBERS, PLEASE—F. Emerson Andrews—*Little*, 101 p., illus. by Aldren A. Watson, \$3. About thinking with numbers and fun with practicing elementary skills.

OCEANOGRAPHY—Maurice Ewing and others; Mary Sears, Ed.—*AAAS*, 654 p., illus., \$14.75. Invited lectures presented at the International Oceanographic Congress held in New York, Aug. 31-Sept. 12, 1959, covering history of oceans, marine life, boundaries of the sea, and cycles of organic and inorganic substances in the ocean.

THE PHYSICAL BASIS OF POLARIZED EMISSION—P. P. Feofilov, transl. from Russian—*Consultants Bur.*, 274 p., \$12.50. Systematic presentation of problems associated with polarization of radiation, includes relatively elementary material useful in understanding polarized emission.

PROGRESS IN VERY HIGH PRESSURE RESEARCH—F. P. Bundy, W. R. Hibbard, Jr. and H. M. Strong, Eds.—*Wiley*, 314 p., illus., \$12. Papers and discussions presented at International Conference held at Bolton Landing, Lake George, N. Y., June 13-14, 1960.

THE QUANTUM MECHANICS OF MANY-BODY SYSTEMS—D. J. Thouless—*Academic*, 175 p., \$5.50. Unified introduction to many-body theory, concerned with problems common to nuclear and atomic physics, the electron theory of metals, and low temperature physics.

QUANTUM THEORY, Vol. I: Elements—D. R. Bates, Ed.—*Academic Press*, 447 p., \$10. Advanced text and reference work on the fundamentals of quantum theory.

RADIOISOTOPE APPLICATIONS ENGINEERING—Jerome Kohl, Rene D. Zentner and Herbert R. Lukens—*Van Nostrand*, 562 p., illus., \$16.50. Sourcebook and graduate course for engineers,

chemists, biologists, physicians and other users of radioisotopes.

REACTORS OF THE WORLD: Second Series—Nuclear Engineering, E. N. Shaw, Ed.—*Simmmons-Boardman*, 13 folded drawings, \$4.50; paper, \$3.50. Cutaway drawings and descriptions of nuclear reactors in Europe, including U. S. OMRE (1958) and N. S. SAVANNAH (1961), as well as Canada's NRU (1957).

THE RELIGIOUS FACTOR: A Sociological Study of Religion's Impact on Politics, Economics and Family Life—Gerhard Lenski—*Doubleday*, 381 p., \$5.95. Sociologist looks at the consequences of religious belief and practice in the everyday life of families, based on a Detroit Area Study.

ROCKS AND HOW THEY WERE FORMED—Herbert S. Zim—*Golden Press*, 54 p., illus. by Harry McNaught and others, 69¢. Factual book for young readers.

THE SCIENCE OF ADHESIVE JOINTS—J. J. Bikerman—*Academic Press*, 258 p., illus., \$8. Monograph covers solid surfaces, formation of adhesive joints, tack, setting, final strength, stresses and experimental strength of adhesive joints.

SCIENCES IN COMMUNIST CHINA—Sidney H. Gould, Ed.—*AAAS*, 872 p., illus., \$14. Papers on the results of scientific research conducted in China, presented at the New York meeting of the American Association for the Advancement of Science, December 26-27, 1960.

SCIENTISTS' APPROACHES TO INFORMATION—Melvin J. Voigt—*Am. Lib. Assn.*, 81 p., paper, \$2.50. Study of scientist's habits and methods of obtaining information with emphasis on printed sources. Based on data from Scandinavian scientists and research librarians with findings of importance to all concerned with storage and retrieval of scientific information.

SECRECY AND PUBLICITY: Dilemmas of Democracy—Francis E. Rourke—*Johns Hopkins Press*, 236 p., \$5. Political scientist's study of the power of government officials to control the flow of information to the public.

SHIP RECOGNITION: Merchant Ships—Laurence Dunn—*Coles (DeGraf)*, 3rd rev. ed., 132 p., illus., \$3.50. Shows how to analyze ships in order to make correct identification according to structure.

THE SYNONYM FINDER—J. I. Rodale and Edward J. Fluck, Eds.—*Rodale Bks.*, 1388 p., thumb-indexed, \$10.95; deluxe, \$16. Alphabetically arranged thesaurus listing synonyms and near-synonyms under each key-word, making cross-referencing unnecessary.

TALKING YOUR WAY AROUND THE WORLD—Mario Pei—*Harper*, 216 p., \$3.75. Profiles of the world's great languages, showing the psychological differences between nations as reflected in British English, German, French, Spanish, Portuguese, Italian, Russian, Latin, Swahili, Chinese and Japanese.

TEACHER SUPPLY AND DEMAND IN UNIVERSITIES, COLLEGES AND JUNIOR COLLEGES, 1959-60 and 1960-61—Ray C. Maul, Dir.—*Research Div., NEA*, 88 p., paper, single copies free upon request direct to publisher, 1201-16th St., NW, Washington 6, D. C. Explores the problem of providing competent teachers for all institutions of higher education.

TECHNICAL REPORT WRITING—Fred H. Rhodes—*McGraw*, 2nd ed., 168 p., \$5.50. Contains expanded chapters dealing with application of statistics, to help those engaged in interpreting experimental work.

TOWARD A SCIENCE OF MANKIND—Laura Thompson—*McGraw*, 276 p., \$5.95. Anthropologist's working hypothesis, to unite anthropology with biology, ecology, the social sciences, the psychological disciplines and the humanities in a multi-discipline science of mankind.

• Science News Letter, 80:76 July 29, 1961

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New Ideas and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 1102. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

• **ACTION TOY** enables children to play more than a dozen different indoor or outdoor games. When a plastic ball is rolled into the toy, it is popped back by a 50-throw clock spring mechanism adjustable to long and short throws. The ball can be caught on the fly or aimed at a target. Package includes a target and instructions.

• Science News Letter, 80:80 July 29, 1961

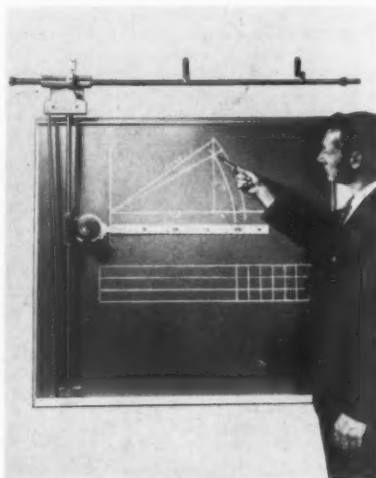
• **NUTMEG MILL** grinds whole nutmeg for use as needed, providing the full strength and rich aroma of the pure spice. The mill is of colonial design and finished in mahogany.

• Science News Letter, 80:80 July 29, 1961

• **PLASTER GUARD** of polyethylene plastic with prongs that fit into the switch mounting protects an electrical outlet during plastering by tightly sealing it off. A pointer projecting from the brightly colored guard serves as a locator after the job is finished.

• Science News Letter, 80:80 July 29, 1961

• **CHALKBOARD DRAFTING MACHINE**, shown in the photograph, for teachers of math and science is a combination protractor, T-square, triangle, scale and straightedge. Intricate diagrams and continuous horizontal and vertical lines can be



easily drawn with this instrument. It can be mounted to any chalkboard by adding a horizontal guide rail across the top.

• Science News Letter, 80:80 July 29, 1961

• **GRADUATED FLASKS** for measuring liquids have hexagonal bases to prevent tipping or rolling. The hard borosilicate glass

flasks come in four sizes with dram graduations for checking contents of packaged liquid commodities.

• Science News Letter, 80:80 July 29, 1961

• **MAIL OPENER** that works like an automatic machine ends ripped checks and mail contents. Suitable for home or office, the opener cuts along only one side of an envelope for easy removal.

• Science News Letter, 80:80 July 29, 1961

• **OPTICS-MICROWAVE DEMONSTRATOR** for science classes illustrates the basic laws of light, measures electromagnetic radiation, and can also send radar signals across a 30-foot classroom. The portable 33-pound unit contains all necessary components in one package. An instruction manual and demonstration accessories come with the machine.

• Science News Letter, 80:80 July 29, 1961

• **WET MOP-DRY DUSTER** has a telescopic handle for cleaning high walls and ceilings. The 10-inch-square polyurethane plastic foam head can be used dry as a duster or wet as a sponge mop. Made of aluminum and cadmium-plated steel, the tool will not rust. One model extends from 3½ feet to 9½ feet.

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Nature Ramblings



Do You Know?

► **DONKEYS** have the peculiar habit of gulping down thistles without batting an eye. Such an act provides evidence that the beast is a practical botanist, for the thistle is a relative of lettuce and has a similar flavor. Both belong to the large plant family known as the Compositae, and both are members of the same major subdivision of that family.

The kinship of the two also can be seen by examining lettuce in its wild state. Unmodified by generations of selective breeding, wild lettuce is, like the thistle itself, a decidedly prickly and scratchy plant. But wild lettuce is far less tasty than the thistle, having a very bitter taste.

The thistle also resembles another well known composite, the dandelion. But the difference is also obvious. In the dandelion the plumes are attached to a sort of stalk, technically termed a beak, extending out from the end of the seed covering. In the thistle they spring directly from the fruit itself.

All three of these plants—lettuce, dande-

Thistle



lion and thistle—are alike in the manner of seed distribution. All use the downy parachute that rides the wind as a conveyance for their lightweight seeds.

Most thistles, notably the big, coarse, hearty bull thistle, are biennials or short-lived perennials. But the spreading, straggling pestiferous Canada thistle is a full-fledged perennial, spreading by millions of seeds and holding on by means of an astonishingly deep and well-developed root system.

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The curve of corn plant conversion of solar energy on a bright day literally follows the sun, upward as light intensity increases and downward all afternoon as intensity falls away.

Lightning is one form of energy that man has yet to harness for his own purposes.

After inhalation of 100% oxygen, the extra oxygen taken up by the body is rapidly depleted when air breathing is resumed, falling to previous levels within two minutes.

A tiny shrimp-like animal, the *Cyathodonta polita*, is an index to water purity according to a recent study, its presence indicating normal and healthy conditions for growth along coasts and its absence, pollution.

Steroid hormones, such as cortisone and sex hormones, can alter the activity of an important enzyme within an organ by changing its physical structure.

• Science News Letter, 80:80 July 29, 1961

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